

This research still further emphasises the fact that no special polychæt fauna characterises the Antarctic seas, and that in all probability in the diatom-ooze of the great depths between Australia and the Antarctic shores even a proportionally greater number of novel types exist than have hitherto been procured. Again, some cosmopolitan forms make their appearance in the Antarctic waters, such as *Phyllodoce madeirensis*, *Glycera capitata*, *Cirratulus cirratus*, and *Serpula vermicularis*. It is curious, however, that *Hauchiella tribullata*, a Zetlandic Terebellid, is not included in the captures, though it was found at Kaiser Wilhelm Land in the American Antarctic region. The author did not meet with examples of the incubatory habit which was thought by Gravier to be a feature of these cold southern regions, e.g. in *Eteone gaini* and *Flabelligera mundata* amongst the polychæts, and in holothurians, actinians, and colonies of tunicates. It is well to remember, however, that the incubatory habit is seen in British seas from fishes to coelenterates.

If criticism may be offered, it is that the author might have made the discrimination of his new and rare species more easily accomplished if he had given at the commencement of each a brief epitome of the specific characters. The accompanying ten plates have their figures fairly represented in lithographic ink, though they lack the fine touch of stone-engraving. The descriptive letters have been omitted from the figures throughout. The entire memoir is a credit to the Australian Government, and to Prof. Benham, whose ability and wide experience enabled him to treat the subject in an effective manner.

W. C. M'INTOSH.

European Archæology.

A Text-Book of European Archæology. By Prof. R. A. S. Macalister. Vol. 1, *The Palæolithic Period*. Pp. xv+610. (Cambridge: At the University Press, 1921.) 50s. net.

SEVENTY years ago the Scandinavian founders of European archæology regarded the shell-heaps or "kitchen-middens" as containing the earliest traces of man's handiwork. Ever since then it has been found necessary to shift man's beginnings further and further into the past, so that now Prof. Macalister is obliged to devote a whole volume, containing nearly 300,000 words, to reach the point at which his Scandinavian predecessors began their narratives. For the type of implement, in stone and in bone, found in the oldest shell-heaps the author adopts the recognised French term "Campignian," although he is of opinion that the culture represented in the shell-heaps was actually evolved in the Baltic Area. By a strange coincidence, if we are to follow our author implicitly,

it is with the introduction of this shell-heap or Campignian culture into Ireland that the history of man commences in our sister-island. "No remains of the Palæolithic period to the end of the Magdalenian stage," writes Prof. Macalister, "have been found in the north of England or else in Scotland or in Ireland, some injudicious publications notwithstanding." The Professor of Celtic Archæology in University College, Dublin, has thus the advantage of surveying the ancient cultures of Europe from a land untrammelled by palæolithic tradition. His first volume covers cultural periods which are unrepresented in Ireland.

Where, when, and how, then, does the modern story of European archæology begin? One may reasonably complain of having to wade through some two hundred preliminary pages before reaching the point at which Prof. Macalister commences his archæological narrative. The first chapter is spent in defining what archæology is and what it is not; the second is devoted to the elements of geology, the third to the evolution and classification of mammals, the fourth to the evolution of man and classification of races, the fifth to eoliths and to *eolithists*, the name which the author gives to those who believe in eoliths as products of human hands. As the following passage shows, Prof. Macalister refuses to begin his archæological narrative with eoliths:—

"The question that these flints present to us is primarily: Are they the work of a conscious agent, fashioning them for a definite purpose, or are they not? The answer to this question appears to be almost wholly subjective, not objective, and is therefore outside the region of scientific study, except perhaps for the psychologist."

We fear that Prof. Macalister understands as little of psychology as of eoliths. For him, true archæology begins with types of flint implement which even a child can perceive have been artificially fashioned.

Archæology is construed in a wide sense by Prof. Macalister. It is made to include not only all things which have been made or used by past generations of mankind, but also skulls, bones, teeth, psychology, and religion. For a writer who warns his readers on almost every page against possible fallacies, it is somewhat daring for him to assert that "Man develops a religious instinct." Then, again, when discussing the "psychology of middle palæolithic man"—men of the Neanderthal type—he not only boldly asserts that they had a religion, but proceeds to draw a picture of this long dead and extinct type of humanity sitting round the fire and discussing momentous problems.

"One would tell of a dream that he had had, in which the dead had appeared to him; another would relate how something, he knew not what, but which surely was not of the common things of nature, had

startled him when he was wandering abroad in the gloom of the forest" (p. 343).

Such fancies may find a place in a schoolboy's essay, but are altogether out of place in a massive work devoted to the archæology of Europe.

The illustrations, which are excellent and numerous, make up for much that is deficient in the text. Students will also be thankful for references to many recent papers and monographs. There is no doubt a real need for such a text-book as this written in English and designed for the use of students of archæology—a text-book to serve as a standard work. We only regret that the author, while displaying a most commendable and painstaking industry, has not risen to the height of his opportunity.

A. K.

Indian Game-Birds.

The Game-Birds of India. By F. C. Stuart Baker. Vol. 1, *Ducks and their Allies (Swans, Geese, and Ducks)*. Second edition. Pp. xvi + 340 + pl. xxx (4l. 4s. net.) Vol. 2, *Snipe, Bustards, and Sand-Grouse*. Pp. xvi + 328 + pl. xix (3l. 13s. 6d. net.) (Bombay: Bombay Natural History Society; London: J. Bale, Sons, and Danielsson, Ltd., 1921.)

THE first of these volumes, dealing with Ducks and their allies, is the second edition of a work published by the author in 1908, which again was a reprint from a series of articles which appeared in the *Journal of the Bombay Natural History Society*. The matter has therefore had the advantage of two revisions and is brought completely up to date as regards nomenclature and records. The second volume, now before us, deals with birds which are included by the sportsman among the game-birds, though in scientific classification they are not so. These are the Snipe, Bustards, and Sand-Grouse. Two further volumes are promised on the Pheasants and Partridges, and with these four by his side the Indian sportsman and amateur naturalist will be very completely equipped not only to identify the game-birds he commonly meets with, but to obtain all the information in regard to their habits and occurrence that is known. Mr. Baker, though now for some years retired from service in India, spent the greater part of his life there, and in these volumes he has given us much of his own observations and experiences; to these he has added contributions from others, both previously published and derived from information sent him by his many Indian correspondents. As a result we have here a most complete account of the life history of these favourite birds.

In every case a good description of adults and nestlings is followed by paragraphs on the distribution, nidification, and general habits, while every species is

illustrated with coloured plates. These are most of them by Mr. H. Grönvold, though some of those in the first volume are from the brush of Mr. G. E. Lodge and the late Mr. J. G. Keulemans. They are reproduced by chromolithography in the case of the Ducks, and by the three-colour process in the second volume. The chromolithography is certainly softer, and perhaps gives a more artistic result. In the three-colour process the colours are decidedly sharper, and better defined, though the very shiny paper necessary for this process certainly detracts from their artistic appearance.

Perhaps one of the most interesting facts recorded in these volumes relates to the habits of two species of sand-grouse, *Pteroclorus alchatus* and *P. senegalensis* (formerly known as *P. exustus*). Although these birds inhabit the dryer and more desert regions of north-west India and Central Asia, they are, unlike some other desert forms, unable to do without water, and resort in enormous flocks to well-known watering-places at certain fixed hours to quench their thirst. It has always been stated by native shikarees that when they have young broods they convey water to them by thoroughly soaking the feathers and the breast and underparts, and that the young birds suck the water thus conveyed to them. This story has been confirmed by Mr. Meade Waldo, who has repeatedly bred *P. alchatus* and other species in confinement and has watched the process of the male saturating the feathers of his breast and subsequently satisfying the thirsty brood.

Nearly all intelligent travellers and even residents in tropical countries have experienced the irritation and annoyance of being unable to identify the strange forms of animal and vegetable life with which they come in contact. Such works as the present, with its beautiful series of coloured plates and carefully prepared descriptions, cannot fail to be of the greatest assistance to all those whom duty or pleasure take to India, and we must congratulate Mr. Baker and the Bombay Natural History Society on their enterprise in supplying two such fine volumes at a comparatively reasonable price as things are at present. We shall look forward to the appearance of the other two volumes promised within a reasonable period.

Water Flow in Pipes.

Hydraulics of Pipe Lines. By Prof. W. F. Durand. (The Glasgow Text Books of Civil Engineering.) Pp. xvi + 271. (London: Constable and Co., Ltd., 1921.) 18s.

THE subject of the flow of water in pipes and channels is not only of very considerable historical and scientific interest, but is also one of